

I. COURSE DESCRIPTION:

This course is the second in a two part series (Applied Exercise Science I and Applied Exercise Science II). The course will be equally divided between theory and practical laboratory time.

Theory: This course examines the physiological adaptations that take place within the human body during exercise and work, including altitude training, thermal stress, and aging so that accurate assessments of fitness and well being can be performed and monitored. Assessment of physical fitness and interpretation of laboratory results will provide the basis for developing and evaluating safe and goal oriented strategies tailored to maximize the benefits of health, fitness and well being. Students will develop a working knowledge of how to train specific body systems (aerobic, anaerobic, and muscular) for optimal performance and develop rehabilitation programs that target specific anatomical areas and related assessment techniques to monitor the clients progress.

Laboratory: This course introduces health and fitness field and laboratory instruments, techniques and procedures for basic and advanced fitness evaluations including several aerobic and anaerobic sub VO_2 max tests, a glucose and cholesterol test, lactic acid test, an ECG test and VO_2 max test. Fitness evaluations are used to establish starting points and used to evaluate a participant's competency in performing physical fitness tests and exercise.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1. Apply knowledge of physiological adaptations that take place within the human body during exercise and work, including altitude training, thermal stress, and aging.
 - The stress of altitude
 - Acclimatization
 - Metabolic, physiologic and exercise capacities at altitude
 - Altitude training and sea-level performance
 - Mechanisms of thermoregulation
 - Thermoregulation and environmental stresses during exercise
 - Aging and physiologic function
 - Age trends
 - Trainability and age
 - Physical activity, health, and longevity

2. Assess levels of physical fitness to develop and evaluate safe and goal oriented strategies tailored to maximize the benefits of health, fitness and well being.
 - Exercising during pregnancy
 - Muscle soreness and stiffness
 - Stress test protocols
 - Structure and function of the respiratory system
 - Gas exchange and transport
 - Regulation of pulmonary ventilation
 - Pulmonary ventilation during exercise
 - Acid-base regulation
3. Develop a working knowledge of how to train specific body systems (aerobic, anaerobic, and muscular) for optimal performance.
 - Training principles
 - Physiology of training
 - Aerobic and anaerobic system changes with training
 - Methods of training
 - Overtraining
4. Develop rehabilitation programs that target specific anatomical areas and related assessment techniques to monitor the clients progress.
 - Clinical applications of exercise physiology for oncology, cardiovascular disease, pulmonary disease, neuromuscular disease, renal disease, and cognitive/emotional diseases
5. Use health and fitness field and laboratory instruments, techniques and procedures for basic and advanced fitness evaluations including several aerobic and anaerobic sub VO_2 max tests, a glucose and cholesterol test, lactic acid test, an ECG test and VO_2 max test.
 - Resting lung volumes
 - Exercise ventilation
 - Resting electrocardiogram
 - Exercise electrocardiogram
 - Isotonic strength
 - Isometric strength
 - Isokinetic strength
 - Anaerobic treadmill running
 - Lower body flexibility
 - Astrand cycle test
 - YMCA test
6. Evaluate a participant's competency in performing physical fitness tests and exercise.

III. TOPICS:

1. Pulmonary structure and function, gas exchange and transport, and the dynamics of pulmonary ventilation
2. Neural control of human movement
3. Acute and chronic responses of the endocrine system to exercise
4. Aerobic and anaerobic power training. Special aids to training and exercise
5. Altitude and thermal stresses in relation to exercise
6. Physical activity for an aging population, cancer and cardiovascular and pulmonary rehabilitation

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Exercise Physiology: Energy, Nutrition & Human Performance 6th ed. By McArdle, Katch and Katch.

V. EVALUATION PROCESS/GRADING SYSTEM:

Theory: 3 Tests - 20% each (Total of 60%)

Lab: Weekly Assignments – 30%

Final Exam – 10%

Total: 100%

The following semester grades will be assigned to students in post-secondary courses:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	2.00
C	60 - 69%	1.00
D	50 – 59%	0.00
F (Fail)	49% and below	
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non-graded subject area.	
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.	

X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.
NR	Grade not reported to Registrar's office.
W	Student has withdrawn from the course without academic penalty.

Note: For such reasons as program certification or program articulation, certain courses require minimums of greater than 50% and/or have mandatory components to achieve a passing grade.

It is also important to note, that the minimum overall GPA required in order to graduate from a Sault College program remains 2.0.

NOTE: Mid Term grades are provided in theory classes and clinical/field placement experiences. Students are notified that the midterm grade is an interim grade and is subject to change.

VI. SPECIAL NOTES:

Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located on the portal form part of this course outline.